

# NASA TECH BRIEF

## Lyndon B. Johnson Space Center



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### Television Noise-Reduction Device

#### The problem:

Color-television video signals transmitted in noisy environments produce poor images. Standard filtering techniques to reduce the noise content of video signals usually lead to loss of picture resolution.

#### The solution:

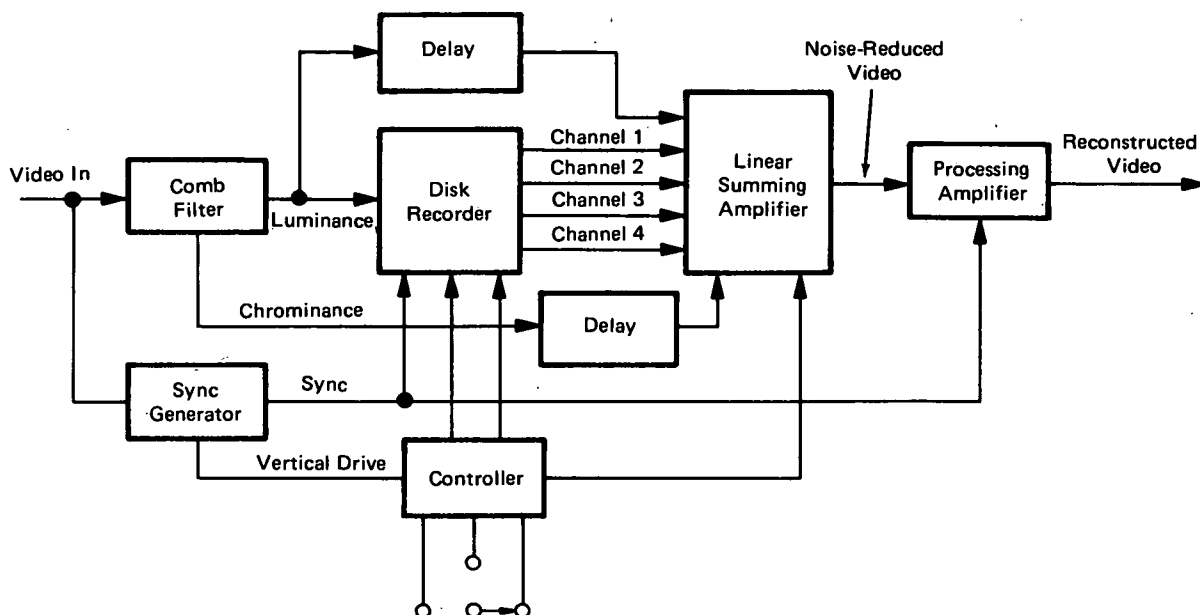
A new system has been developed for improving the signal-to-noise ratio in color-television video signals.

#### How it's done:

The system consists of a luminance-chrominance separator, a disk recorder, a summing amplifier, a control device, and a processing amplifier, as shown in the figure. The system divides the color video signals

into luminance and chrominance components. As the chrominance signal is sensitive to time-base instabilities, it is not processed and is preserved as is. The sync generator strips the synchronizing signals from the video input and generates its own synchronizing signals, which are applied to the recorder for control of its servo-mechanism.

The luminance signal is recorded continually on the disk recorder for a total of four recorded television frames. The luminance signal then is summed also with the previously-recorded luminance signals in the summing amplifier and averaged, so that the signal level is the same as the original luminance signal. The chrominance signal then is added to the new luminance signal, and the result is a noise-reduced television signal. The



Television Noise-Reduction Device

(continued overleaf)

processing amplifier then is employed to restore synchronizing signals and reference a 3.58-MHz color sub-carrier. The controller, which obtains its reference from the sync generator, generates the necessary logic control commands to the disk recorder and the weighting commands to the summing amplifier.

The system greatly improves the signal-to-noise ratio with little or no loss in picture resolution. By storage of the luminance component, which is summed with the chrominance component, the system performs mathematical integration of the basically-repetitive television signals. This integration of the signals over the interval of their repetition causes little change in the original signals and eliminates random noise.

**Note:**

Requests for further information may be directed to:  
Technology Utilization Officer  
Johnson Space Center  
Code JM7  
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Reference: TSP73-10431

**Patent status:**

This invention is owned by NASA, and a patent application has been filed. Inquiries concerning non-exclusive or exclusive license for its commercial development should be addressed to:

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